SURA Coastal Ocean Observing and Prediction (SCOOP) Program

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Brief Project Summary

The Southeastern Universities Association (SURA) Coastal Ocean Observing and Prediction (SCOOP) Program is a multi-institutional collaboration whose partners are working to implement a modular, distributed system for real-time prediction and visualization of the impacts of extreme atmospheric events, including water level, inundation, and wave height. SCOOP partners are implementing an infrastructure to support short-term forecasts, integrate models with real-time observations, and serve results based on standards that enable access, interpretation, and incorporation into decision-support tools. Moreover, the architecture will support design requirements for a national infrastructure of distributed sensors and predictive models that integrate regional and national observing systems along the coasts.

IOOS

This project is contributing to the Integrated Ocean Observing System (IOOS) by

- Developing models that increase the ability of emergency managers to prepare for extreme weather events
- Creating tools that allow users to find and access available data more efficiently
- Fostering partnerships among organizations involved in IOOS

Key Accomplishments

Modeling

- Wind fields are an integral input for models that predict wave height and water level during a hurricane. Although several individual wind field data sets are available from multiple sources, ensemble wind generation provides a statistical approach to predicting the "worst case" scenario for surge and flood levels. This approach can be very useful to emergency managers and the public during a storm. The University of Florida (UF) provides the National Hurricane Center (NHC) forecast tracks that define storm wind fields and also creates tracks that deviate from the official track. This provides a more accurate calculation of the maximum possible surge or flood level for a given storm. Products are available for use within minutes of an NHC advisory.

- UF and the Virginia Institute of Marine Science (VIMS) are making progress towards high-resolution simulations of street-level inundation caused by storm events. UF's CH3D model forecasts surge and inundation using high-resolution grids in Charlotte Harbor, Tampa Bay, and a large portion of the Florida east coast, while VIMS' ELCIRC model predicts inundation in the Washington, D.C., metropolitan area and the tidal Potomac River. Results predicting inundation from these high-resolution models can be used by emergency managers and planners and by resource managers of water control structures, and they are capable of operational status at the National Weather Service.

- The Bedford Institute of Oceanography (BIO) and Louisiana State University (LSU) set up routine, operational, fine-resolution, wave forecasting for the entire Gulf of Mexico and northeastern coast of the U.S. using WAVEWATCH3, the operational forecast model of the NOAA National Center for Environmental Prediction (NCEP). The model setup allows optional use of forecast wind fields from a variety of sources to generate high-quality wave forecasts for coastal areas of the U.S. during hurricane and extreme storm events.

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Data Search and Catalog

- The University of Alabama in Huntsville (UAH) provides a storm-based data search-and-order Web interface allowing users to quickly locate data and associated information for a specific tropical storm. This capability will directly benefit coastal researchers by allowing them to quickly find the data of interest within the vast amounts of data available.

- UAH designed and implemented the SCOOP Data Catalog to document information for data produced by SCOOP science modeling partners. The SCOOP Data Catalog directly supports the data management and interoperability goals of the IOOS community by providing a single tool that allows coastal researchers to search and order model and in-situ data available from multiple distributed archive locations.

Hypoxia Events

- In July 2004, an unusual hypoxia event in Long Bay, off of Myrtle Beach in South Carolina, resulted in low dissolved oxygen levels, low temperatures, significant vertical stratification, and evidence of upwelling in nearshore waters. The event triggered collaborations between coastal and fisheries management agencies and regional and subregional coastal ocean observing systems. A workshop conducted in June 2005 informed state and local managers about what was known about the hypoxia event and resulted in state and local observing systems providing coastal and fishery managers access to near-real-time data and metadata.

Oil Spill Response

- The Texas General Land Office (TGLO), the state agency responsible for oil spill response and mitigation in Texas coastal waters, and NOAA collaborate during oil spill events to provide an effective coordinated response. Both use the General NOAA Oil Modeling Environment (GNOME) software to predict the fate and transport of spilled oil, but TGLO uses its own system forecasts. A SURA/SCOOP collaboration with the Gulf of Mexico Coastal Ocean Observing System applied the Ocean.US Data Management and Communications recommendations to make it easier for TGLO to modify its forecast models to produce GNOME-compatible files. As a result, when Hurricane Katrina disrupted the supply of NOAA forecasts used by GNOME, NOAA was able to rapidly switch over to the TGLO forecast fields during an oil spill event, greatly reducing the response time.

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